AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A butadiene-based polymer having a 1,3-butadiene monomer unit, characterized in that a cis-1,4 bond content and a vinyl bond content in the 1,3-butadiene monomer unit as measured by a Fourier transform infrared spectroscopy (FT-IR) and calculated according to the following equations (IV) and (VI) are not less than 98.0% and not more than 0.3%, respectively, and a ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn) is 1.6-3.5,

(cis-1,4 bond content) = e/(e+f+g)x100 (%) · · · · · (IV)

(vinyl bond content) = g/(e+f+g)x100 (%) · · · · · (VI)

wherein e, f and g are derived from the following matrix (III):

$$\begin{bmatrix} 1.7455 & 0 & -0.0151 \\ -0.0454 & 0.4292 & -0.0129 \\ -0.007 & 0 & 0.3746 \end{bmatrix} \begin{bmatrix} \log_{10}(a/d) \\ \log_{10}(a/b) \\ \log_{10}(a/c) \end{bmatrix} = \begin{bmatrix} e \\ f \\ g \end{bmatrix} \quad \cdots \quad (\text{III})$$

wherein a represents a mountain peak value near 1130 cm^{-1}, b represents a valley peak value near 967 cm^{-1}, c represents a valley peak value near 911 cm^{-1} and d represents a valley peak value near 736 cm^{-1} in the FT-IR spectrum.

2. (original): A butadiene-based polymer according to claim 1, wherein the cis-1,4 bond content and the vinyl bond content satisfy a relationship of the following equation (I):

(vinyl bond content)≤0.25x((cis-1,4 bond content)-97) (%) ····· (I)

3. (original): A butadiene-based polymer according to claim 1, wherein the ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn) is 1.6-2.7.

4. (original): A butadiene-based polymer according to claim 1, wherein the polymer consists of 80-100% by mass of 1,3-butadiene monomer unit and 20-0% by mass of the other monomer unit capable of copolymerizing with 1,3-butadiene.

5. (original): A butadiene-based polymer according to claim 4, wherein the polymer is made of only 1,3-butadiene monomer unit.

6. (original): A butadiene-based polymer according to claim 1, wherein the number average molecular weight (Mn) is 100,000-500,000.

7. (original): A butadiene-based polymer according to claim 6, wherein the number average molecular weight (Mn) is 150,000-300,000.

8. (currently amended): A method of producing a butadiene-based polymer, characterized in that monomers at least containing 1,3-butadiene are polymerized through a solution polymerization ~~method except a vapor-phase polymerization~~ at a temperature of ~~not higher~~lower than 25°C in the presence of a catalyst system~~, comprising~~ consisting of:

(A) component: a compound containing a rare earth element of Atomic Number 57-71 in the Periodic Table or a reaction product of such a compound with a Lewis base;

(B) component: an organoaluminum compound represented by the following general formula (II):

$$AlR^1R^2R^3 \cdots\cdots (II)$$

(wherein R^1 and R^2 are the same or different and are hydrocarbon group having a carbon number of 1-10 or a hydrogen atom, and R^3 is a hydrocarbon group having a carbon number of 1-10 provided that R^3 may be the same as or different from R^1 or R^2) and/or (D) component: an aluminoxane; ~~and~~

(C) component: at least one of Lewis acid, a complex compound of a metal halogen compound and Lewis base and an organic compound containing an active halogen, and

a conjugated diene monomer, and

the catalyst system is previously prepared in the presence of component (A), component (B) and/or component (D), component (C), and the~~a~~ conjugated diene monomer.

9-12. (canceled).

13. (previously presented): A rubber composition, characterized in that a rubber component contains not less than 10% by mass of a butadiene-based polymer as claimed in claim 1.

14. (original): A rubber composition according to claim 13, wherein less than 10 parts by mass of a filler is compounded based on 100 parts by mass of the rubber component.

15. (original): A rubber composition according to claim 14, wherein the rubber composition is sulfur crosslinkable.

16. (previously presented): A tire, characterized in that a rubber composition as claimed in claim 13 is used in any member of the tire.

17. (currently amended): A method of producing a butadiene-based polymer according to claim ~~8~~11, wherein the rare earth element containing compound in the component (A) is a salt of neodymium soluble in a hydrocarbon solvent.

18. (previously presented): A method of producing a butadiene-based polymer according to claim 17, wherein the rare earth element containing compound in the component (A) is a branched carboxylate of neodymium or a reaction product of such a salt with a Lewis base.